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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,708	06/26/2003	Douglas M. Beall	SP02-146	5076
22928	7590	09/13/2005	EXAMINER	
CORNING INCORPORATED SP-TI-3-1 CORNING, NY 14831			GREENE, JASON M	
			ART UNIT	PAPER NUMBER
			1724	

DATE MAILED: 09/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/606,708	BEALL ET AL.	
	Examiner	Art Unit	
	Jason M. Greene	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-7 and 11-22 is/are allowed.
- 6) ☒ Claim(s) 23-34 is/are rejected.
- 7) ☒ Claim(s) 8-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. <u>091105</u> |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Response to Arguments

1. Applicant's arguments, see page 7, lines 4-20, filed 30 June 2005, with respect to the 35 USC 102(a) rejections of claims 1-3, 6-11, 14, 15, 17 and 20 have been fully considered and are persuasive. The 35 USC 102(a) rejections of claims 1-3, 6-11, 14, 15, 17 and 20 have been withdrawn.

Specifically, the Examiner agrees with Applicants that the Beall et al. and WO 02/41972 A1 references fail to teach or fairly suggest the ceramic filter of claim 1 having the claimed pore size distribution, permeability factor, and maximum median pore diameter.

2. Applicant's arguments, see page 7, lines 21-24, filed 30 June 2005, with respect to the 35 USC 103 rejections of claims 7 and 18-22 have been fully considered and are persuasive. The 35 USC 103 rejections of claims 7 and 18-22 have been withdrawn. Specifically, since Applicants' amendment distinguished independent claim 1 over the prior art made of record, these rejections are moot.

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3. Applicant's arguments, see page 7, lines 25-32, filed 30 June 2005, with respect to the 35 USC 103 rejections of claims 23, 24 and 30-34 have been fully considered, but they are not persuasive.

Specifically, the Examiner does not agree with Applicants that the prior art made of record fails to teach or fairly suggest the method of claim 23 wherein the batch of raw materials comprises magnesium oxide. First of all, the Examiner notes that the phrase "forming a batch of raw materials comprising magnesium oxide" in line 2 has been interpreted to mean that magnesium oxide is supplied by a MgO source (i.e. MgO, magnesium hydroxide, magnesium carbonate, magnesium nitrate and combinations thereof) which when heated to a sufficiently high temperature in the absence of other raw materials yields substantially pure magnesium oxide (see specification paragraph 0033). Since Merkel teaches the batch of raw materials comprising talc as a source of magnesium oxide, the Examiner agrees that Merkel does not teach or fairly suggest using magnesium oxide as a batch material. However, Beall explicitly teaches using magnesium oxide as a raw material in Table A. While it is acknowledged that all of the Beall examples use talc as a raw material, the fact that Beall explicitly recites MgO as a "raw material" in Table A suggests to one of ordinary skill in the art that MgO can be substituted for talc. In other words, why would Beall classify MgO as a "raw material" if it was not envisioned as a starting material for producing the cordierite? With regard to Applicants' arguments concerning the pore structure of the cordierite formed using MgO, the Examiner notes that it would have been obvious to one of ordinary skill in the art to select an appropriate particle size of

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MgO to provide the recited pore structure and CTE through routine experimentation. Specifically, since Beall teaches the recited pore structure and the use of MgO as a raw material, one of ordinary skill in the art could merely use routine experimentation to select an appropriate MgO material to produce a cordierite having the recited pore structure.

Claim Objections

4. Claims 8-10 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 8 and 9 recite the median pore diameter being between 4 and 40 micrometers and between 6 and 25 micrometers, respectively. However, since claim 1 recites the median pore diameter being less than 15 micrometers, claims 8 and 9 recite ranges outside the range recites in claim 1. Accordingly, the examiner suggests Applicants amend claims 8 and 9 such that upper end of the range is less than 15 micrometers. Similarly, with regard to claim 10, the Examiner suggests Applicants rewrite the limitation between 7 micrometers and 15 micrometers" in line 2 as "at least 7 micrometers and less than 15 micrometers".

Claim Rejections - 35 USC § 103

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5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 23, 24 and 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merkel in view of Beall et al. (U.S. Patent Application Publication 2002/0004445 A1) or Published International Application WO 01/91882 A1. The Examiner notes that the WO 01/91882 reference is equivalent to the Beall reference and has a publication date greater than 1 year prior to the effective filing date of the instant application.

With regard to claims 23, 33 and 34, Merkel discloses a method for fabricating a wall-flow filter comprising forming a batch of raw materials comprising talc, alumina, and silica raw materials in combination with extrusion aids comprising 3 percent by weight methylcellulose as binder, 0.5-1.0 percent by weight sodium stearate as lubricant, plasticizing and shaping the batch, wherein shaping is done through an extrusion die to form a green honeycomb body having an inlet end, an outlet end, and a multiplicity of cells extending from the inlet end to the outlet end, drying and firing the green honeycomb body at a rate of 15-100 °C/hr to a maximum temperature of 1405-1430 °C, with a hold of 6-25 hrs. to form a structure which is predominately of a phase approximating the stoichiometry of $\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18}$ (cordierite) and has a coefficient of thermal expansion over a range of 25-800 °C of $6 \times 10^{-7}/^\circ\text{C}$, and plugging a first portion of

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cells at the inlet end, and a second portion of cells at the outlet end such that each cell is plugged at only one end in col. 1, line 55 to col. 8, line 62.

Specifically, Merkel discloses the green honeycomb body being fired by heating to a maximum temperature of 1410 °C at a rate of 25 °C/hr with a hold of 8 hrs in Example 1 in Table 2.

Merkel does not disclose the batch of raw materials comprising magnesium oxide or the honeycomb exhibiting a pore size distribution such that $d_{50}/(d_{50}+d_{90})$ is less than 0.70 or the soot loaded permeability factor is less than 1.55.

As noted in the previous action, Beall et al. teaches forming a similar honeycomb structure satisfying the recited pore size distribution properties in Example D2 in Table D on pages 8-9. WO 01/15062 teaches the same honeycomb structure in Example D2 in Table D on pages 25-26.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the final pore structures of the filters of Beall et al. and WO 01/15062 into the method of Merkel to produce honeycomb filters having high volumetric heat capacity and a low pressure drop across the length of the filters, as taught by Beall et al. in paragraph 0015.

Beall et al. and WO 01/91882 A1 teach using MgO as a raw material in Table A on pages 7 and 20, respectively.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the MgO of Beall et al. and WO 01/91882 A1 for the talc of Merkel in that such are alternate raw materials in the art for the

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production of cordierite honeycomb bodies. Mere substitution of one known cordierite forming raw material for another in the art without a showing of unexpected or unobvious results being within the scope of one having ordinary skill in the art. As noted above, since one of ordinary skill in the art could select an appropriate MgO material to provide the recited pore structure through routine experimentation, such a limitation is not seen as showing unexpected or unobvious results.

With regard to claim 24, Merkel discloses the batch further including spinel having a stoichiometry of MgAl_2O_4 in col. 2, lines 62-63.

With regard to claims 30-32, Merkel discloses the magnesium oxide being supplied by magnesium oxide, the alumina being supplied by aluminum oxide or boehmite, and the silica being supplied by fused silica.

7. Claims 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merkel, Beall et al. and WO 01/91882 A1 as applied against claim 23 above, and further in view of Hamaguchi et al.

Merkel does not disclose the batch further including a pore former having a median particle diameter of 3-140 micrometers.

Hamaguchi et al. discloses a similar method of making a filter wherein the batch includes a graphite pore former having a median particle diameter of 40 micrometers in col. 3, lines 65-68 and Table 1.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the graphite pore former of Hamaguchi et al. into the method of Merkel to allow the porosity of the filter to be adjusted, as suggested by Hamaguchi et al. in col. 3, lines 65-68.

Allowable Subject Matter

8. Claims 1-7 and 11-22 are allowed.
9. Claims 8-10 would be allowable if rewritten or amended to overcome the objection set forth in this Office action.

Conclusion

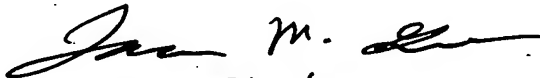
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (571) 272-1157. The examiner can normally be reached on Monday - Friday (9:00 AM to 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M. Greene
Examiner
Art Unit 1724


9/11/05

jmg
September 11, 2005